

## APPLICATION DEVELOPMENT ACCESS WORKFLOW DESIGNER

# Microsoft Tackles The Workflow Beast

ACCESS WORKFLOW DESIGNER IS A POWERFUL TOOL THAT PRODUCES SOPHISTICATED RESULTS

A common programming task in workgroups is tracking and controlling information as it flows through the company. Many business processes take well-defined paths, but automating these workflows using typical development tools can be difficult. A major proposal or client contract, for example, might be drafted by an engineer, routed to three supervisors for updates and approval, sent to the legal department for review, then routed back to the engineer and sales department for presentation to the customer. At any point in the process, the document might take one or more side trips, or bounce back and forth between two people as they make incremental refinements.

access and Web capabilities in Microsoft Access 2000 to read and modify a Microsoft SQL Server database.

Access Workflow Designer is a powerful demonstration of what can happen when key features of Microsoft's premier tools—Access 2000, SQL Server, Visual Basic, and IIS—are merged to accomplish workflow design. The tools themselves are easy to use and deliver sophisticated results. The documentation is some of Microsoft's best, with plenty

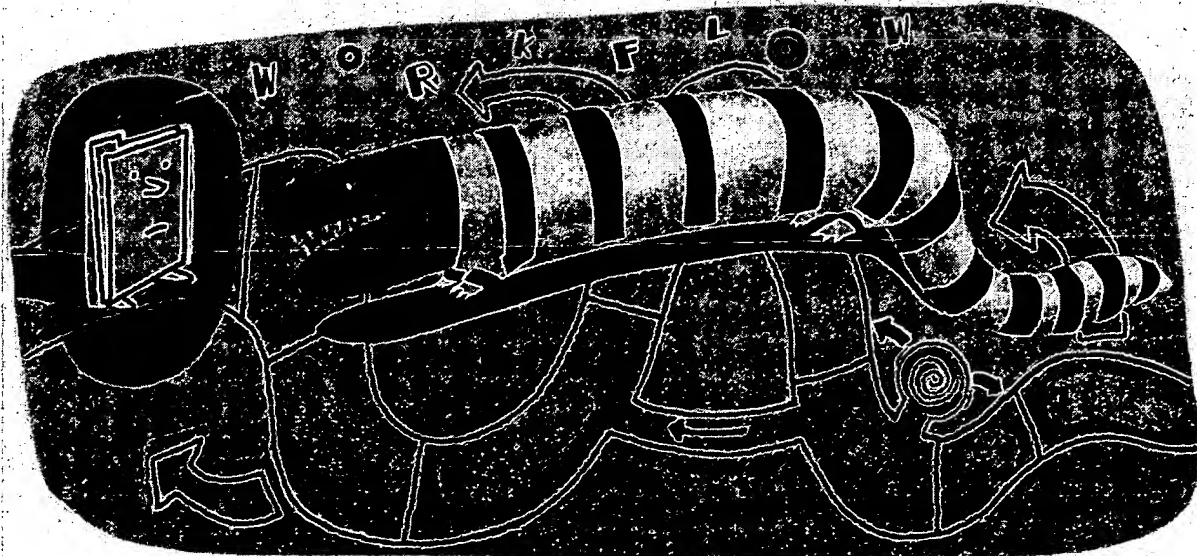
more to be found on the Office Developer Web site. Best of all, the price is right—at least once you've shelled out the \$1,000 or so for the developer version of Office 2000.

Access Workflow Designer lets a process architect create an application that allows users to manage the flow

rigid, predefined structure.

With Access Workflow Designer, every workflow project begins with a SQL database that contains information about the process; the database is designed and built before any of the workflow design tools are applied. For example, the database for a client-contract workflow might contain information about the client, project, people involved, and due dates. The database can be designed using a product such as Embarcadero's ER/Studio before turning it into a workflow process.

Next, the database is readied for use. If Workflow Designer, the main tool in the product, is running against a specific database for the first time, the Database Registration wizard starts up. This tool automatically modifies the schema to add fields for maintaining states, which are designer-defined



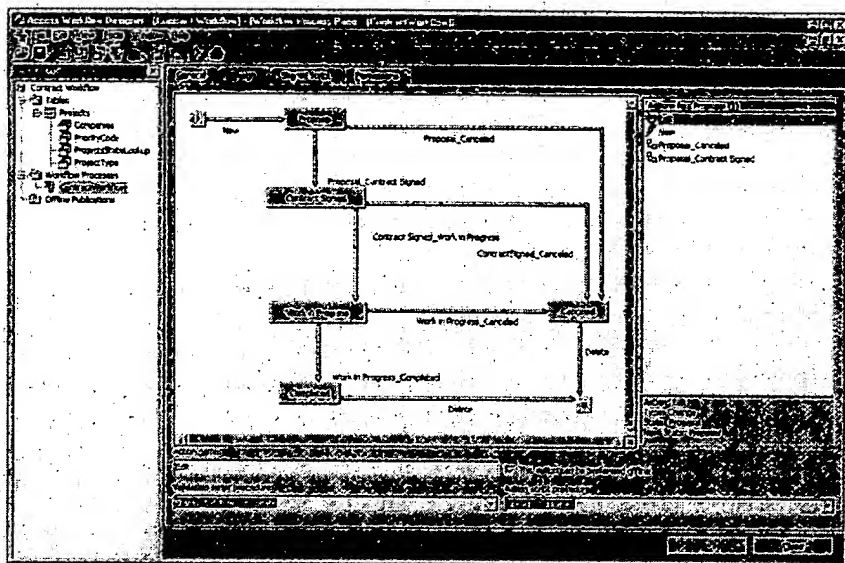
As part of its push to make Microsoft Office the premier business knowledge-management platform, Microsoft has added a workflow design tool to its top-of-the-line Microsoft Office 2000 Developer product. Access Workflow Designer for SQL Server, formerly known by the code name Grizzly, is a set of tools that uses the data

of information among individuals or teams. A user can check the state of a particular task or document and keep track of items within the user's scope of responsibility. The tool builds the workflow's features on a SQL Server database that's customized for each workflow application, rather than requiring data to be forced into a

stages in the workflow that correspond to important milestones or other parts of the process; applying business rules; setting up offline replication, so users can make modifications when not connected to the network; and instituting optional row-level security.

In our review, the wizard added seven tables, 31 stored procedures, and

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**WINDOW DRESSING:** The diagramming tool in Access Workflow Designer defines the data stored in the workflow support tables.

three views to the database to keep track of system status information. I'm always a bit leery of applications that modify databases on my behalf, but the tool seemed to do a good job of keeping workflow data separate from the primary data in the tables.

The Database Registration wizard also creates a Web site for the workflow application. Unfortunately, this Web site needs to be located on the default Web server, which must reside on the same machine as the one running SQL Server and the Workflow Designer Server tools. I dislike having multiple servers running on a single machine, particularly Microsoft Internet Information Server and SQL Server, if I expect a heavy user load. Hopefully, this restriction will be eased or removed in future versions of Access Workflow Designer.

Once the database is built, the real fun begins. Using the Access Workflow Designer tools, you can define various states through which the proposal and contract will pass.

For the client contract workflow, I created states for Proposal, Contract Signed, Work in Progress, and Completed, reflecting the normal sequential flow for this project. Since a project can be canceled at any point in its life, I built workflows leading from each of these states to an additional Canceled state. I also designed actions

that take a contract from one state to the next, such as a Sign Contract action that moves a project from Proposal to Contract Signed.

The figure above shows how the process might look in Access Workflow Designer. The diagramming tool defines the data stored in the workflow support tables, specifying the routes that a document can take through the workflow.

As data shifts between states, Workflow Designer fires several different events that can be scripted in VBScript. The chart on the following page shows some of the event options and their scope. But while it is convenient to be able to customize the way the solution operates, the VBScript limitation means many modern language features and debugging tools are lacking.

One complex, but necessary, task is setting up security for the workflow solution. Because the product is based on SQL Server, an almost endless number of combinations of roles and permissions can be assigned to different objects in the data-

base. This lets you integrate the set of roles and permissions that best reflects the actual business environment for which the workflow is designed.

For example, users in the accounting department may be permitted to see items only in an Invoicing state, whereas members of the legal department might see documents only in the Legal Review state. Because the developer can assign row-level permissions, specific items can be assigned to different users or groups.

The result of using the Workflow Designer tools is a database that now comprises the original data tables, a new field in some of these tables for tracking states, several workflow lookup tables, and a few dozen stored procedures that do the work of the application, including triggering movement between states.

I consider Access Workflow Designer's server-side procedures and state management to be definite strong points, because they allow any kind of client application to run against the database, rather than requiring the use of a particular front-end tool or application.

Another nice feature is that once you have a workflow application up and running, you can save it to use as

a template for future projects. This can be a big time-saver, even if you have to do a lot of work to modify the new project. One caveat, however: Workflow Designer can create templates only from workflows that have a Web-site interface. On the other hand, if you choose to use a different development environment, such as Visual Basic, that environment will probably have its own way of saving project templates, so this drawback isn't as onerous as it might appear.

As its name implies, Access Workflow Designer is closely associated with Microsoft Access, though most of the

## AT A GLANCE

**ACCESS  
WORKFLOW  
DESIGNER FOR  
SQL SERVER**  
Microsoft  
Redmond, Wash.  
800-426-9400  
www.microsoft.com

**PRICE**  
Free with Office 2000  
Developer

## STRENGTHS

- Choice of client type
- Granular security

## WEAKNESSES

- Difficult installation
- Demanding system requirements

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tools can run independently of Access.

With its rich set of tools and wizards for building dynamic Web pages, Access 2000's new Data Pages feature is perfect for Web client workflow applications. Data Pages is the easiest way I've found to create a client workflow application. If you want to try something else, such as Visual Basic, be sure to look at the section in the developer's guide on alternative user interfaces, as well as at the white paper entitled "Creating a Team Solution User Interface Using Microsoft Visual Basic," which can be found on the Microsoft Office Developer Web site.

To provide a link to objects in the SQL Server database, Access Workflow Designer includes the Workflow Designer Toolbar. Because this is an ActiveX control, it can be hosted in almost any Windows development environment. Besides listing all the available states in the workflow, the toolbar lets the user add a new workflow and take the information offline, if the developer allows that option.

The offline workflow features make heavy use of the offline features of Internet Explorer 5.0, so your users will have to upgrade to this version.

The Access Workflow Designer tools lend themselves just as easily to other types of client applications, such as Visual Basic forms applications, Active Server Pages Web sites, and other functions that support database access. The tools don't even need to support ActiveX controls, as long as they support buttons or other components necessary to program the equivalent of the Workflow Designer Toolbar.

But remember: This is version 1.0, and as such, it still has a number of rough spots. The biggest problem by far is the nightmare of installing the various parts of the product. Access Workflow Designer truly earns its Grizzly code name in this area. I cannot remember a program installation that was as finicky or even, in places, as downright nasty as this one.

For starters, the system require-

ments are extremely rigid. Windows NT 4.0 Server (with Service Pack 4 or later) or Windows 2000 Server in per-seat licensing mode are required. But the main problem is the mandated SQL Server 7.0 (with Service Pack 1) in per-seat licensing mode. This caused me no end of trouble, because I could not use the version of SQL Server that is part of my Microsoft Data Engine

cess 2000, the Office 2000 Web components, and Internet Explorer 5.0. But don't install the redistributable version of Microsoft Data Engine that comes with Office 2000 Developer: Workflow Designer requires the version in Office 2000 Premium Edition or SQL Server 7.0.

The documentation includes a long installation script that demands precision, even with details that seem irrelevant. And even then, you have only about a 50% chance of success. My advice: Stop all SQL Server NT services before you begin the installation, even though you'll probably still get hung up when the setup program asks if it can stop SQL Services. The installation routine seems unable to handle dependent services, such as SQL Server Agent.

After everything was finally up and running, the only other problem I encountered was when I was creating workflow solutions from templates. The New Team Solution wizard automates the creation of a new workflow from a template. But this often took 10 to 15 minutes, even for simple solutions; more than once I left it running overnight without finishing. The wizard gives no status information other than an animated graphic, and since Task Manager said it was running, I never knew whether it had died, and if so, why.

Nevertheless, once it is operating properly, Access Workflow Designer will prove to be a valuable tool for companies that need to automate a large number of sophisticated workflow processes. By contrast, for occasional, simple workflow designs, the significant system requirements and other hassles that accompany this 1.0 release will not be worth the trouble.

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## USING WORKFLOW EVENTS IN SCRIPTS

Microsoft Access Workflow Designer supports a number of events a workflow architect can use when scripting tasks. Determining the most appropriate places for code is a major part of the developer's job.

To execute a script...	Use	Scope
When a row is inserted into the database	OnCreate	State
When a row is deleted from the database	OnDelete	State
When a row is updated in the database	OnChange	State
When the state is entered	OnEnter	State
When the state is exited	OnExit	State
Between states	OnTransition	Transition
That specifies a condition for an automatic change in state	OnTimeout	State and transition

DATA: MICROSOFT

Universal subscription, which can be installed only in per-server mode. To get the job done, I had to find a non-production SQL Server box and a full copy of SQL Server 7.0—not an easy task despite all the servers we run in my office. So much for this being a developer tool.

I tried installing the server and client portions of Workflow Designer on a standalone Windows 2000 (Release Candidate 2) machine, which Microsoft says can be done. But I was never successful, even with last-ditch, special help from Microsoft.

Another hassle is that the prerequisites, including portions of Office 2000 Developer, need to be installed in just the right order. In other words, don't try installing the product on an existing box, because if the applications and server software were installed in the wrong order, it won't work.

The requirements for developer machines are a bit looser, but not much. For these machines, you'll need to install SQL Server 7.0 or Microsoft Data Engine, plus a minimum of Ac-

More on workflow: [www.informationweek.com/761/access.htm](http://www.informationweek.com/761/access.htm)